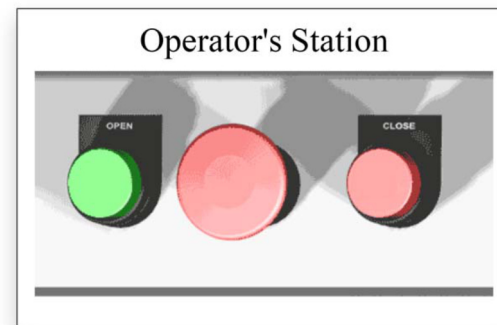
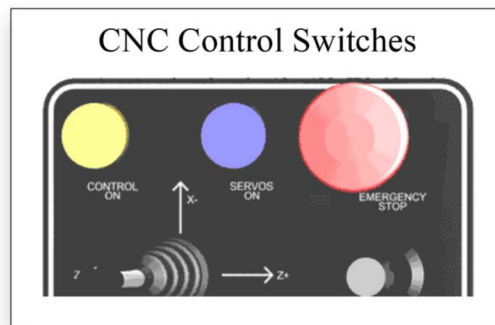


OmniTurn G4 CNC: Servos Won't Turn On

First verify E-stop switches on CNC and on Operator's Station (Palm Box) are disengaged



If the servos are not coming on, the most common reason is a bad Emergency stop contact, either in the control E-stop button or the E-stop on the Operator's Station. Engage and disengage the E-stop switches a few times, then try to turn on the servos again.

Next, perform some ohmmeter tests, as described on the following pages.

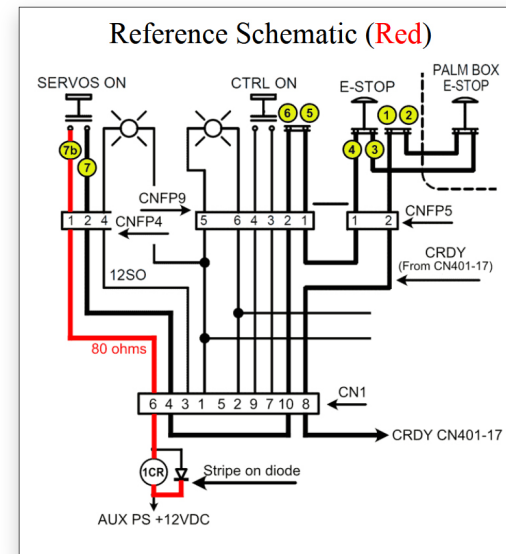
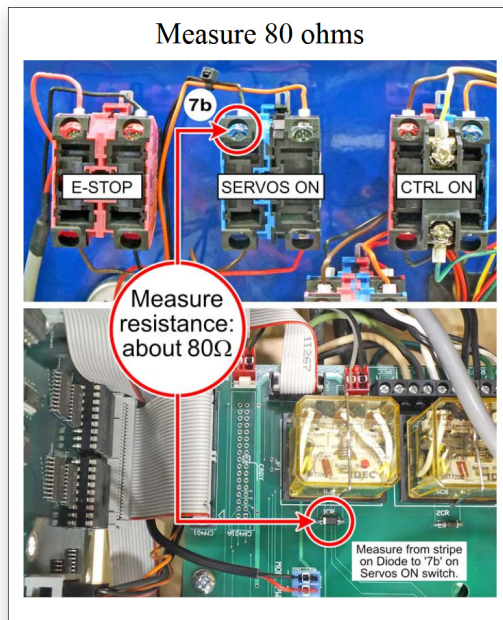
Ohmmeter Tests

If the E-Stops are disengaged, and you have no loader connected to your OmniTurn, you can quickly check the entire E-stop string with an ohmmeter.

Two tests are required:

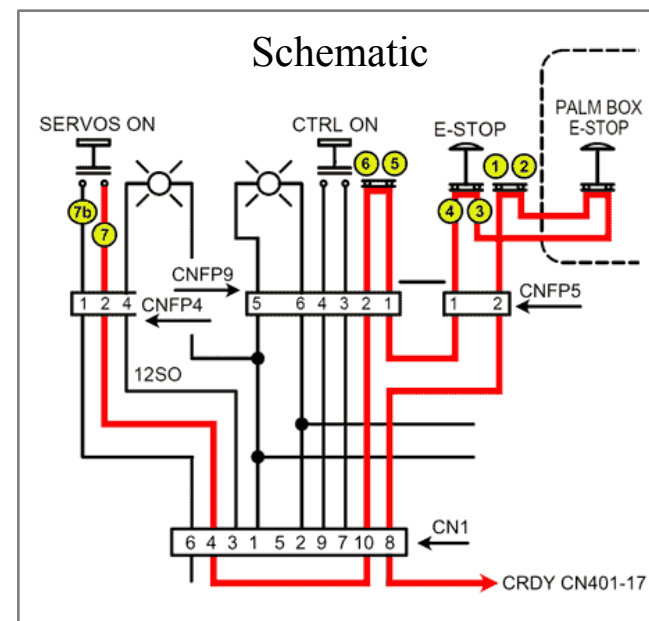
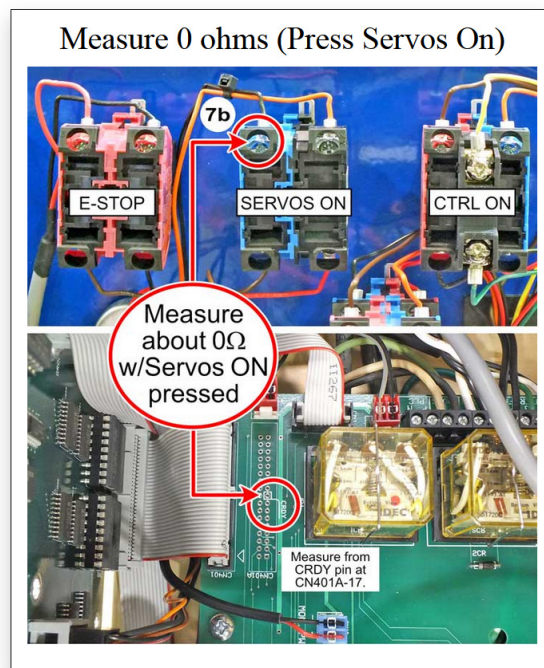
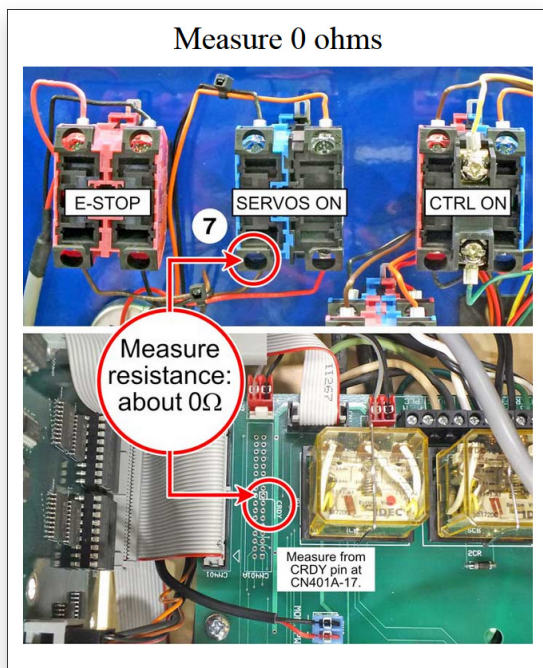
- Test 1 checks relay 1CR and the ribbon cable going to the Servos On switch.
- Test 2 checks all the connections from the Servos On switch to the "Control Ready" (CRDY) test point on the connect card.

Ommeter Test 1: With the power off, make sure the E-stop buttons are not pushed in and measure the resistance from the striped end of the diode next to 1CR to the black wire on the top of the blue contact block on the Servos On switch. This should be about 80 ohms. This measures through the 1CR relay coil and the E-stop string to the Servos On switch.



If the ohmmeter shows 80 ohms, this section of the E-stop string is good go to Ommeter Test 2 on next page. If the ohmmeter shows open circuit, there could be issue with the ribbon cable between CN1 on Connect Card and CN1 on Front Panel Connect Card, or with 1CR, or with front panel connector CNFP4. Examine the cables, unplug and replug both ends, and replace 1CR. (You can temporarily use 2CR).

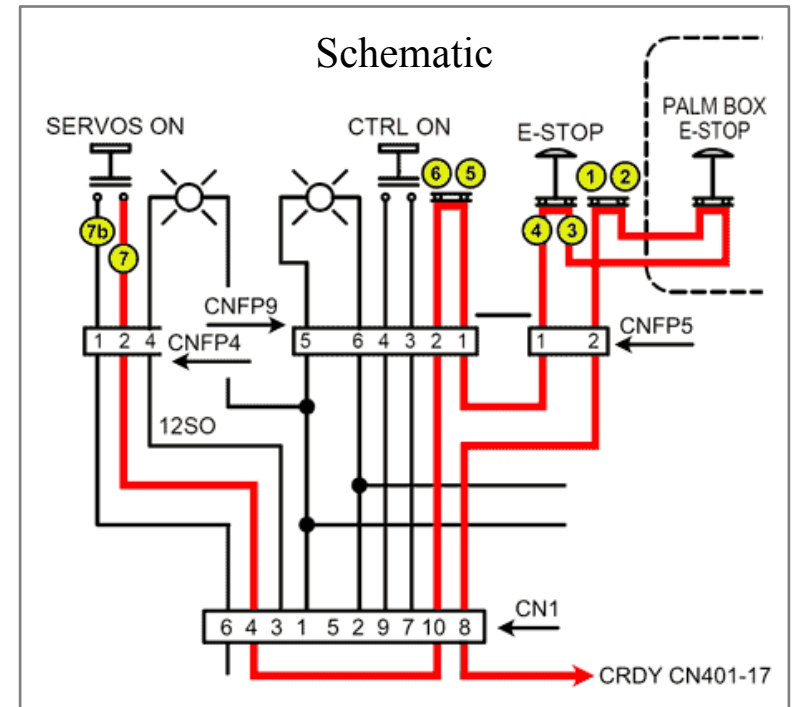
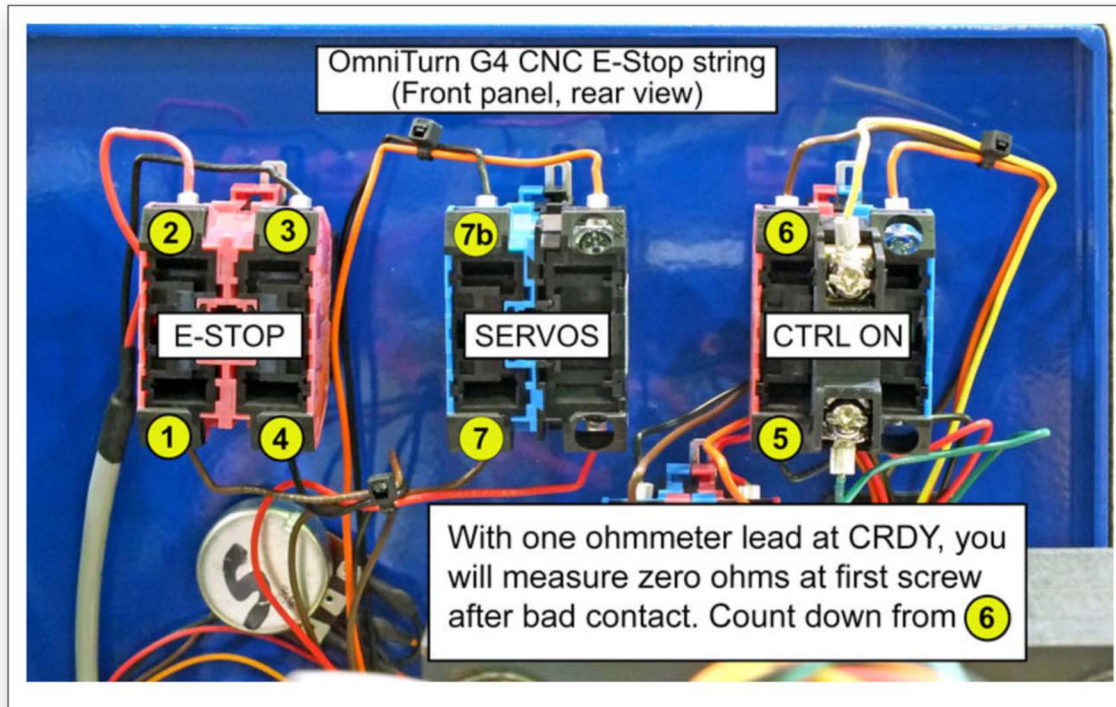
Ommeter Test 2: With the power off, make sure the E-stop buttons are not pushed in and measure the resistance from the CRDY test point in the middle of CN401A to the brown wire on the bottom of the blue contact block on the Servos On switch. This should be close to 0, say less than 5 ohms. This measures through the entire E-stop string to the bottom of Servos On switch. See schematic.



- If the ommeter registers OL (open circuit), one of the contacts in the Palm Box E-Stop, Control E-Stop, or Control On switch is bad.
To determine which one, go to More Ohmmeter Tests on next page.
- If the ommeter reads about to zero ohms, the E-stop string is good, but the Servos On switch may be bad.
 - Move the lead to top contact on Servos On switch.
Have someone press the Servos On switch: Meter should indicate close to 0 ohms.
 - If the ommeter registers close to zero ohms with the Servos On switch pressed, the switch is good, but the CRDY may be bad; go to Voltage Tests on page five.

More Ohmmeter Tests (*Meter reads O/L at #7*)

For these tests, you will leave one ohmmeter lead at CRDY (CN401A-17), and "walk" the other lead through the switch terminals per the picture below, **starting at #6 and going to #1**. See schematic. When the OL (open circuit) condition changes to zero ohms you have found the bad contact. Refer to the list below the picture.

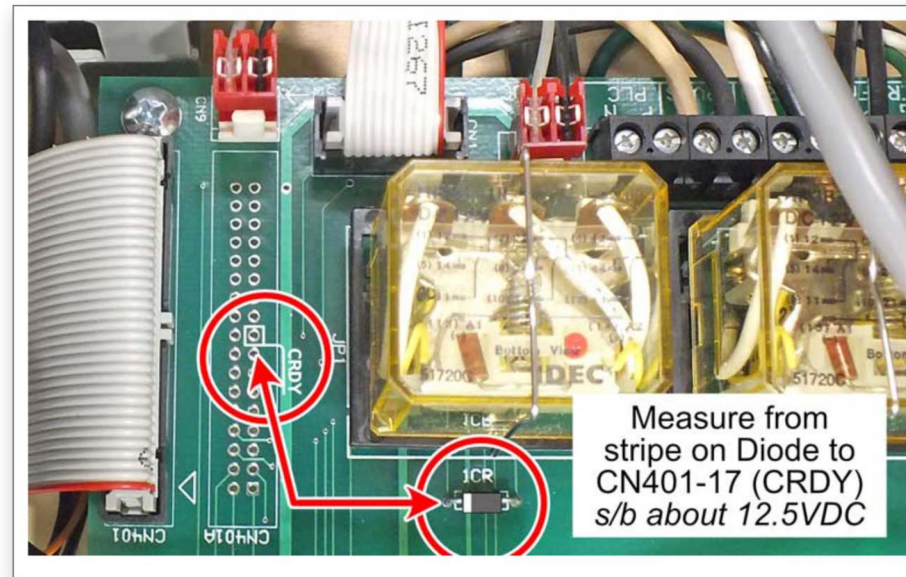


1. If about 0 ohm at #6, then possible issue with *CN1* or *CNFP4* on the Front Panel Connect Card
2. If about 0 ohm at #5, then replace the *Control On switch* (p/n 995-12-201)
3. If about 0 ohm at #4, then possible issue with *CNFP5* or *CNFP9* on the Front Panel Connect Card
4. If about 0 ohm at #3, then replace the *Front Panel E-stop switch* (p/n 995-12-103)
5. If about 0 ohm at #2, then replace the *OpSta E-stop switch* (p/n 998-12-104)
6. If about 0 ohm at #1, then replace the *Front Panel E-stop switch* (p/n 995-12-103)
7. If **still not** about 0 ohm at #1, then possible issue with *CN1* or *CNFP4* on the Front Panel Connect Card

Voltage Tests

You will need a voltmeter set to DC volts. This first test is necessary if the [ohmmeter tests 1 & 2](#) were both good, but your servos still don't turn on. This test checks for the "Computer Ready" (CRDY) signal.

Turn the control on: stop at the screen that shows the "Servos off or external halt.." message.



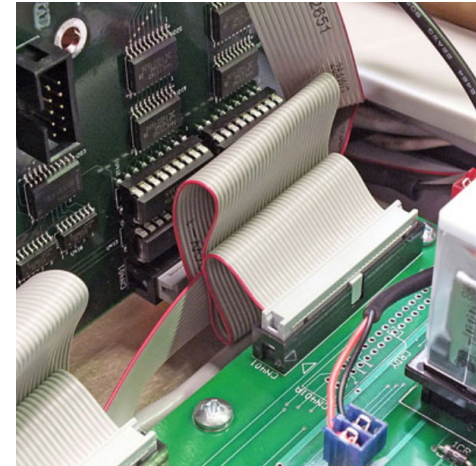
- Locate CN401A on the Connect Card.
- First, to check the meter connections, hold the RED meter on the lead at the stripe end of the diode near 1CR, and touch the BLACK meter lead to the chassis. You should read about 12.5VDC.
- To check CRDY, leave the red lead on the lead at the stripe end of the diode, and move the black lead to CN401A-17 (CRDY). It's the 9th pin down from the square pin. You should read about 12.5VDC. If the voltage is NOT about 12.5VDC, go to No CRDY Voltage on next page.
- If the voltage IS about 12.5VDC, have someone press the Servos On button; the voltage should not drop below about 10 or 11VDC. If it goes close to zero, go to No CRDY Voltage on next page. If it stays above 10 or 11 volts, your servos may have come on, otherwise there is some other issue.

No CRDY Voltage

- If the voltage is NOT about 12.5VDC, at CN401-17, the 5AX card isn't pulling the CRDY pin down, possibly because of a bad output driver chip, or there's a bad connection in the CN401 ribbon cable.

To check the ribbon cable, turn off the CNC and unplug ribbon cable between CN401 on 5AX card and connect card.

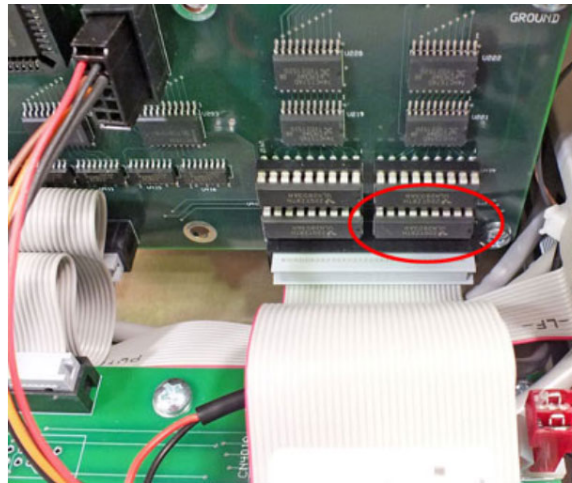
Examine the connectors to insure the ribbon is securely in place. Replug the ribbon cable, power up the CNC and see if you can turn on the servos. If not, recheck the voltage at CN401-17 as above: RED meter lead at the lead at the stripe end of the diode, and BLACK meter lead at CN401-17).



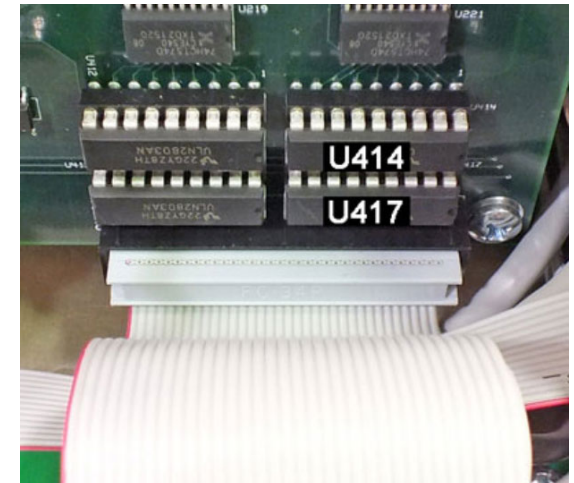
CN401 Ribbon Cable between 5AX and Connect Card

If still not 12.5VDC, you will need to replace the driver IC U417.

To replace U417, unplug the power cord for the control, remove the screws that hold the triangular brackets to the chassis, and tilt the card back to get access. Remove U417 (the lower right IC) and set it aside, then remove U414 and plug it in to U417's socket.



Driver IC U417



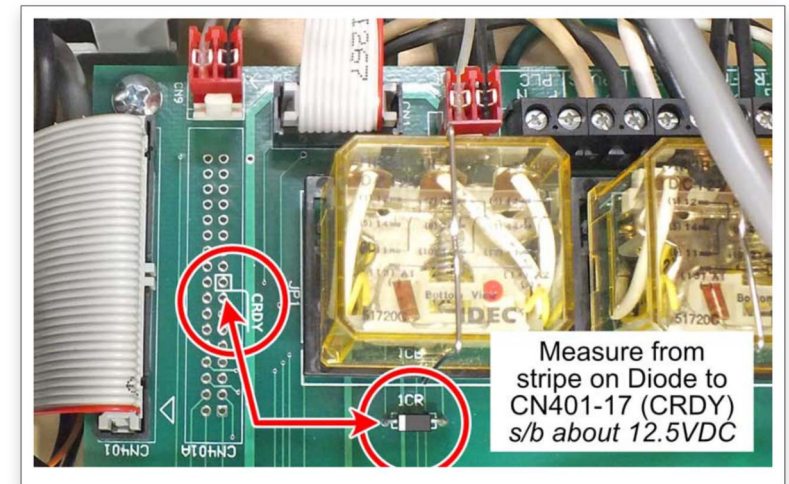
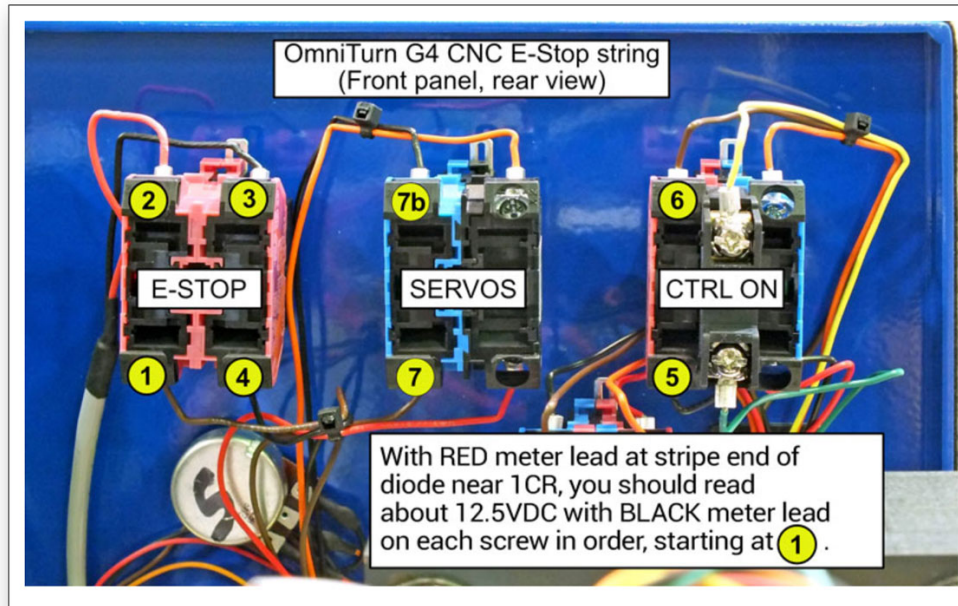
5AX Driver IC's U414 (spare) and U417

When removing the IC's from their sockets, be careful not to bend the leads- work them out gradually by slipping a small screwdriver or similar tool under one end, then the other. When plugging them into their sockets make sure that none of the leads get bent.

More Voltage Tests (*CRDY measures 12.5V*) (These voltage tests duplicate the ohmmeter tests).

If the CRDY voltage is about 12.5VDC, and the ohmmeter tests measure good, the servos should come on. Leave the RED meter lead at the lead at the stripe end of the diode, and touch the BLACK meter lead to each of the terminals on the E-stop and Control On switches as shown in the image below.

Start at #1, and check for about 12.5VDC. Reference the list below.



1. If not about 12.5VDC at #1, then possible issue with *CN1* or *CNFP5* on the Front Panel Connect Card
2. If not about 12.5VDC at #2, then replace the *Front Panel E-stop switch* (p/n 995-12-103)
3. If not about 12.5VDC at #3, then replace the *OpSta E-stop switch* (p/n 998-12-104)
4. If not about 12.5VDC at #4, then replace the *Front Panel E-stop switch* (p/n 995-12-103)
5. If not about 12.5VDC at #5, then possible issue with *CNFP5* or *CNFP9* on the Front Panel Connect Card
6. If not about 12.5VDC at #6, then replace the *Control On switch* (p/n 995-12-201)
7. If not about 12.5VDC at #7, then possible issue with *CN1* or *CNFP4* on the Front Panel Connect Card
8. If about 12.5VDC at #7, move the black meter lead to #7b and press the Servos ON button.
If not about 12.5VDS at #7b with button depressed, the *Servos ON switch* is bad (p/n 995-12-102)